

ALATALEBERIS NEW GENUS (CRUSTACEA, OSTRACODA) FROM THE TERTIARY OF VICTORIA AND SOUTH AUSTRALIA

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ABSTRACT: A new trachyleberidid ostracode genus, *Alataleberis*, is described from the Tertiary of southeastern Australia for the new species *A. johannae* (type species), *A. robusta*, and *A. miocenica*, and the new species and subspecies *A. ornithopetrae ornithopetrae* and *A. ornithopetrae willungae*. Our new genus is compared with specimens of *Alatacythere* from the Gulf Coast of the United States and with *Pterygocythereis* from the Atlantic/Mediterranean. Its stratigraphic usefulness is indicated.

The Tertiary Ostracoda of southeastern Australia remain poorly known (McKenzie 1974) although recent work in the Miocene of Victoria suggests that the situation is about to ameliorate (McKenzie & Neil 1983, Whatley & Downing 1983, McKenzie & Peypouquet 1984). During a broader study of several Miocene sequences in Victoria, one of us (M.T.W.) came across a new taxon with apparent affinities to the genus *Alatacythere* from the Gulf Coast Tertiary of the United States. Discussion with the senior author led to the consensus that this species represented a new generic category (n. gen. D. aff. *Alatacythere* of McKenzie, in Cooper 1979). The senior author had already identified several species of the new taxon: in the Eocene of Victoria (2 species); and, in the Eocene-Oligocene of South Australia and Victoria (1 species with 2 subspecies). The Miocene species is a fourth member of this group. As far as we are aware, there are no Pliocene or Quaternary species, nor are any species earlier than the (P16) Eocene taxa known to us. The general localities are illustrated in Fig. 1; more detailed locality data are provided with the species descriptions.

As the senior author's collections include reference material from the United States Tertiary, it was convenient to compare our new genus with the type and related species of *Alatacythere*. We also compare it with the well known Atlantic and Mediterranean genus *Pterygocythereis*.

The conventions RV=right valve, LV=left valve, L=length, H=height and B=breadth are used throughout. Types are stored in the palaeontological collections of the Museum of Victoria under Register Numbers NMV P109896-P109901, P111421-P111429 and P111790-P111792.

SYSTEMATIC PALAEOLOGY

Family TRACHYLEBERIDIDAE Sylvester Bradley 1948

Subfamily TRACHYLEBERIDINAE Sylvester Bradley 1948

? Tribe PTERYGOCYTHERIDINI Puri 1957

Genus *Alataleberis* gen. nov.

TYPE SPECIES: *Alataleberis johannae* sp. nov.

ETYMOLOGY: *Alata*-(L)=winged; and suffix *-leberis* (Gk)=sloughed skin, a reference to the fact that

Ostracoda, like other crustaceans, are ecdysists. The genus is feminine.

DIAGNOSIS: A new pterygocytherideid genus with a carapace which features alate ventral ridges usually perforated along their length, non-alate dorsal ridges and secondary yoke-like, arcuate posterior ridges, the valve surfaces otherwise being smooth. Minor features of the ornament include anteromarginal spinules and strong dorsal and posteroventral spines. Inner lamellae are moderately broad with no or only very small vestibules; marginal pore canals are flexuous, often branched and fairly numerous; normal pore canals are sieve-type, celled and scattered; central muscle scars comprise 4 adductors, a V-shaped frontal scar and a mandibular scar; the hinge is hemiamphidont. The subcentral tubercle may be well (*A. robusta*) or poorly developed but an eye tubercle is distinct in all species; as is sexual dimorphism.

REMARKS: The new genus has been compared previously (McKenzie 1974, McKenzie, in Cooper 1979) with *Pterygocythereis* and *Alatacythere*. Both these genera were formerly placed in the family Brachycytheridae (Moore 1961) but were transferred to Trachyleberididae in a more recent revision (Hartmann & Puri 1974). The type species of *Pterygocythereis* Blake 1933 is the North Atlantic and Mediterranean taxon *P. jonesi* (Baird 1850). We illustrate this species in Fig. 4 F, J and Fig. 5 E, F, G, I, J along with *P. ceratoptera* (Bosquet 1852) in Fig. 5 H, both specimens coming from the senior author's Bay of Naples collection. Our new genus resembles *Pterygocythereis* in that the shell surface is smooth and the margins are spinose in both genera. The differences, however, are striking. Anteromarginally, *Alataleberis* bears spinules rather than broad flat-topped "spines" as in *Pterygocythereis*; dorsally, the Atlantic/Mediterranean taxon bears a marginal row of large spines rather than a few thorn-like spines on a low dorsal ridge as in *Alataleberis*; and the ventral ridge in *Pterygocythereis* carries a row of separate large spines which increase in length posteriorly (the final spine being about twice as long as its neighbours) whereas in *Alataleberis* the ridge itself increases in height posteriorly, terminating in a

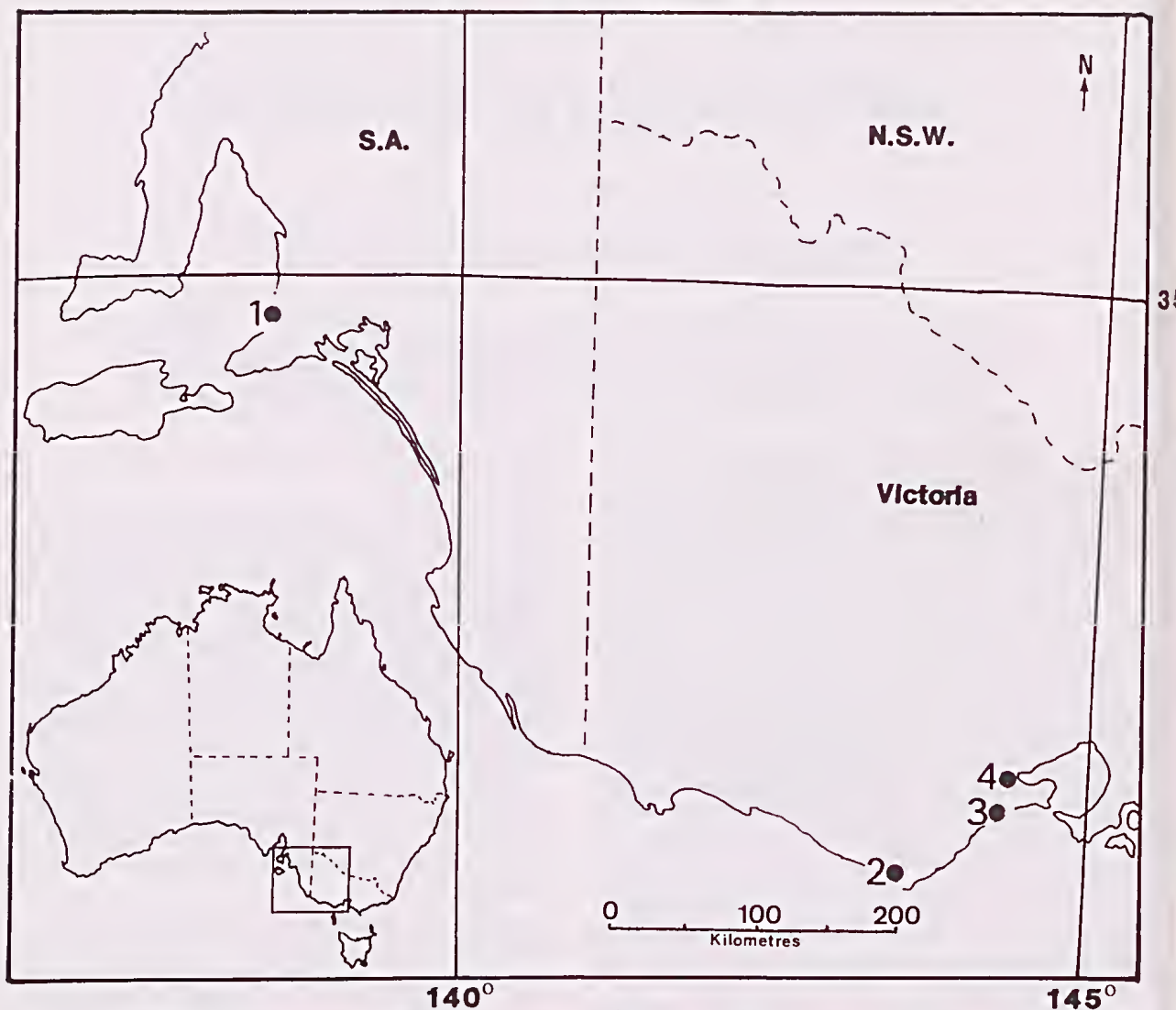


Fig. 1—Locality diagram. 1, Maslin Bay/Aldinga Bay. 2, Browns Creek/Castle Cove. 3, Torquay. 4, Geelong/Fyansford.

single stout spine. Therefore, in dorsal view *Alataleberis* is regularly subhastate with the greatest breadth posteromedial (Fig. 2 B, G, H) while in *Pterygocythereis* the profile is subelliptical (discounting the spines)—well illustrated in Bonaduce, Ciampo and Masoli (1975, Plate 29, Fig. 3). Posteriorly, *Alataleberis* is subacuminate in all species (except the LV of *A. robusta*) whereas *P. jonesi* is rounded posteriorly (although *P. ceratoptera* is subacuminate). The eye tubercle is prominent and nearly spherical in *Pterygocythereis* but somewhat smaller in *Alataleberis*. Finally, there is a slight difference in hingement, with *Pterygocythereis* having a smooth posterior RV tooth while in *Alataleberis* this tooth is divided into two elements by a small furrow, the more anterior element being larger (Fig. 4 I). Another species of *Pterygocythereis* from the Alum Bluff Chipola Miocene

of Florida, U.S.A. is also illustrated (Fig. 5 A, B) for comparison.

The genus *Alatacythere* Murray & Hussey 1942 was described from the Vicksburg (Oligocene) of the Gulf Coast region of the United States where it ranges from Late Cretaceous to Neogene. Specimens in the senior author's collection from the type horizon in the Byram Marl, Mississippi, are A-1 juvenile females. We illustrate instead, therefore, an adult male and female from the Mint Spring Oligocene, south of Hiwanee, Missouri, collected by the late Prof. H. V. Howe from a roadcut on U.S. Highway 45 (Fig. 4 G, Fig. 5 K, L, M). This taxon seems very close to the type species *A. ivani* Howe 1951 (*nom. nov. for Cythereis (Pterygocythereis?) alexanderi* Howe & Law 1936—the designated type species of *Alatacythere*—which is a junior homonym) except that it

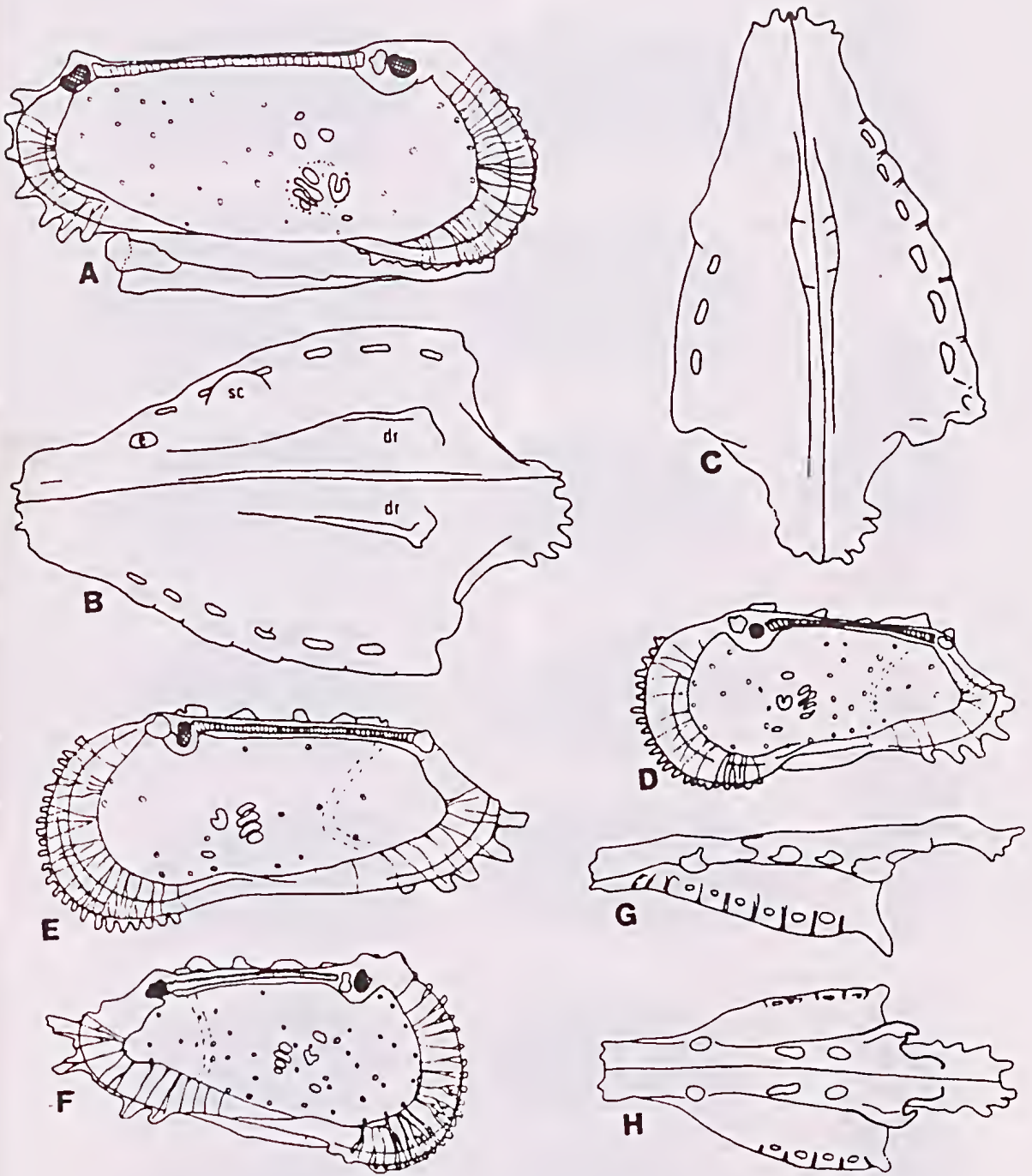


Fig. 2—A, *Alataleberis robusta* sp. nov., male, internal, L.V., $\times 75$. B, *Alataleberis robusta* sp. nov., male, dorsal, $\times 75$. C, *Alataleberis robusta* sp. nov., male, ventral, $\times 75$. D, *Alataleberis miocenica* sp. nov., female, internal, R.V., $\times 75$. E, *Alataleberis johanna* sp. nov., male, R.V., $\times 75$. F, *Alataleberis ornithopetrae ornithopetrae* subsp. nov., female, internal, L.V., $\times 75$. G, *Alataleberis ornithopetrae ornithopetrae* subsp. nov., female, dorsal, L.V., $\times 75$. H, *Alataleberis ornithopetrae willungae* subsp. nov., female, dorsal, $\times 75$.

is more elongate. In *Alatacythere*, anteromarginal spines are broad and flat-topped, unlike the anteromarginal spinules of *Alataleberis*; dorsal spines are few, broad and fragile, especially anterodorsally, in *Alatacythere* (Howe & Law 1936, Plate IV, Fig. 23)—the anterodorsal spine is damaged in our figured specimens (Fig. 5 K, L, M)—whereas *Alataleberis* has a low dorsal ridge terminating in a posterior spine (all species) and sometimes having 2-3 other short thorn-like spines. The strong ventral ridge which provides the generic prefix for both taxa is reinforced by buttressing along its length in both *Alatacythere* and *Alataleberis*, but is not perforated in any species of *Alatacythere* known to us whereas it is distinctly perforated in most *Alataleberis* species, especially those in which this ridge is most notably developed (*A. robusta* and *A. ornithopetrae*). In *Alataleberis*, the dorsal and ventral ridges are yoked together by an arcuate subridge (poorly defined in *A. robusta*) but there is no trace of this subsidiary feature in *Alatacythere*, doubtless because the latter lacks a distinct dorsal ridge. Eye tubercles are small and weak in *Alatacythere* but always distinct in the new genus. In dorsal view, both genera are subhastate with the ventral alar extensions making for a more extremely "winged" profile in most *Alatacythere* species although a few Neogene taxa with low ventral ridges have been described (Fig. 4 G, Fig. 5 K, L, M). *Alatacythere* sp. from the Upper Oligocene Chickasawhay Limestone, Florida, U.S.A. is also illustrated (Fig. 5 C, D) for comparison. Hartmann and Puri (1974) also designated the genera *Pterygocythere* Hill 1954, and *Incongruellina* Ruggieri 1958 with its subgenera *Incongruellina* Ruggieri 1958 and *Lixouria* Uliczny 1969 as belonging in Pterygocytherideidini. Of these taxa, *Lixouria* was based on a misidentified type species and the latest reviewer (Uffenorde 1981) considers it indeterminate to subfamily. The taxon illustrated as "*Lixouria*" *unicostulata* (Kuiper 1918) s.l. by Uffenorde (1981, Plate 2, figs 9-10) seems close to such non-ptyerygocytherideidine genera as *Ruggieria* Keij 1957 and *Keijella* Ruggieri 1967. Sissingh (1973) established a new genus, *Carinovalva* Sissingh 1973 for taxa placed in *Lixouria* by Uliczny and, later, himself (Sissingh 1972). All these taxa clearly differ from *Alataleberis*. Firstly,

Pterygocythere has a well-developed, strongly-convex, dorsal flange above the hinge line that is diagnostic and is used to distinguish it from *Alatacythere* which otherwise it closely resembles; no species of *Alataleberis* has this feature. Next, *Incongruellina* and *Carinovalva* both have prominent ventral carinate (or keel-like) ridges and their general shape is similar to the well known European Cainozoic genus *Bosquetina* Keij 1957; all three genera, apart from their generally different shape to *Alataleberis*, lack the dorsal ridge which is a feature of the new taxon.

Our questionable reference of *Alataleberis* to Pterygocytherideidini is based on the fact that Hartmann and Puri (1974, p. 38) define the tribe as comprising alate trachyleberidids with simple normal pores whereas all species of *Alataleberis* have sieve-type normal pores, although difficult to illustrate (Fig. 4 H). Since it is now known that both sieve-type and simple normal pore canals can occur on the same trachyleberidid species, this criterion has lost the taxonomic weight it formerly had in determining relationships within the family. Nevertheless, our uncertainty remains and we recognise that future workers may decide that *Alataleberis* is convergent towards Pterygocytherideidini rather than belonging in the tribe.

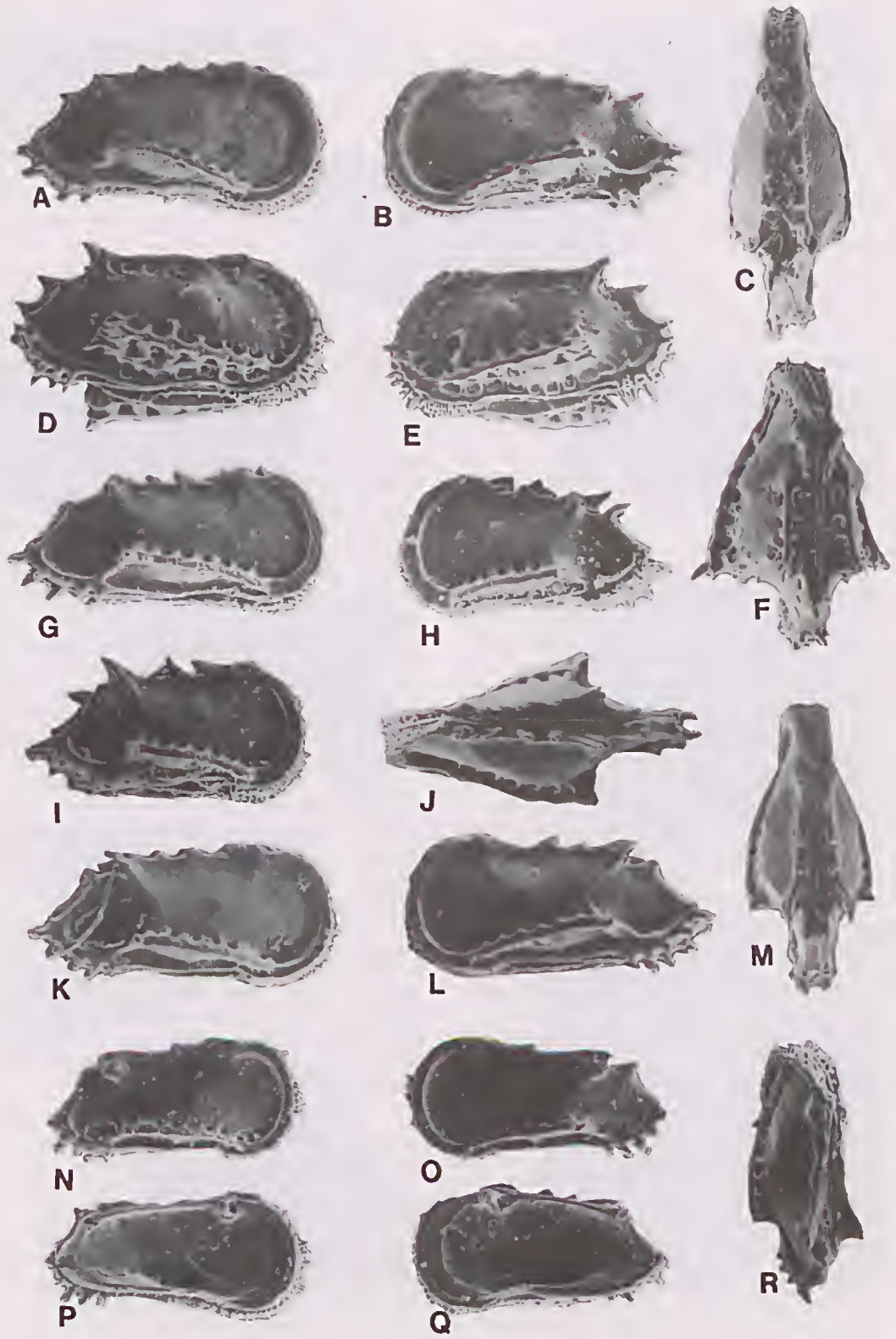
A similar uncertainty is recorded for the only taxon known to us which may be ancestral to our new genus, that is *Ponticulocythere* Dingle 1981, described from the Maastrichtian of southeast Africa (Dingle 1981) and yet to be recognised from Australia (Bate 1972, Neale 1975). Like *Alataleberis*, *Ponticulocythere* has dorsal and ventral ridges and is compared by its author with *Bosquetina* and *Pterygocythereis*. But *Ponticulocythere* differs in that its hinge is more primitive, being entomodont rather than amphidont, and because both its dorsal and its ventral ridge are perforate and buttressed—in *Alataleberis* only the ventral ridge is perforate and buttressed in most species (except *A. robusta* in which the dorsal ridge also is buttressed but not perforate).

Alataleberis johannae sp. nov.

Figs. 2 E, 3 A, B, C

ETYMOLOGY: *johannae* = locality name from the Johanna River area in Victoria, where the type locality is exposed along the coast.

Fig. 3—A, *Alataleberis johannae* sp. nov., paratype, male, lateral, R.V., $\times 45$. NMV Reg. No. P111792. B, *Alataleberis johannae* sp. nov., paratype, male, lateral, L.V., $\times 45$. NMV Reg. No. P111792. C, *Alataleberis johannae* sp. nov., paratype, male, dorsal, $\times 47$. NMV Reg. No. P111792. D, *Alataleberis robusta* sp. nov., paratype, female, lateral, R.V., $\times 45$. NMV Reg. No. 111424. E, *Alataleberis robusta* sp. nov., paratype, female, lateral, L.V., $\times 45$. NMV Reg. No. P111424. F, *Alataleberis robusta* sp. nov., paratype, female, dorsal, $\times 43$. NMV Reg. No. P111424. G, *Alataleberis ornithopetrae ornithopetrae* subsp. nov., paratype, male, lateral, R.V., $\times 45$. NMV Reg. No. P111791. H, *Alataleberis ornithopetrae ornithopetrae* subsp. nov., paratype, female, lateral, L.V., $\times 43$. NMV Reg. No. P111790. I, *Alataleberis ornithopetrae ornithopetrae* subsp. nov., paratype, female, lateral, R.V., $\times 44$. NMV Reg. No. 111790. J, *Alataleberis ornithopetrae ornithopetrae* subsp. nov., paratype, male, dorsal, $\times 46$. NMV Reg. No. P111791. K, *Alataleberis ornithopetrae willungae* subsp. nov., paratype, male, lateral, R.V., $\times 45$. NMV Reg. No. P111429. L, *Alataleberis ornithopetrae willungae* subsp. nov., paratype, male, lateral, L.V., $\times 45$. NMV Reg. No. P111429. M, *Alataleberis ornithopetrae willungae* subsp. nov., paratype, male, dorsal, $\times 42$. NMV Reg. No. P111429. N, *Alataleberis miocenica* sp. nov., holotype, male, lateral, R.V., $\times 45$. NMV Reg. No. P111427. O, *Alataleberis miocenica* sp. nov., holotype, male, lateral, L.V., $\times 45$. NMV Reg. No. P111427. P, *Alataleberis miocenica* sp. nov., paratype, male, lateral (internal), L.V., $\times 45$. NMV Reg. No. P111422. Q, *Alataleberis miocenica* sp. nov., paratype, female, lateral (internal), R.V., $\times 46$. NMV Reg. No. P111423. R, *Alataleberis miocenica* sp. nov., holotype, male, dorsal, $\times 45$. NMV Reg. No. P111427.



MATERIAL AND DISTRIBUTION: Numerous carapaces and valves from several horizons in the sections exposed at Browns Creek and Castle Cove, Victoria.

DESCRIPTION: Carapace medium-large (length 0.90-0.97 mm); subrectangular in lateral view with a smooth shell surface and weakly developed subcentral tubercle; anterior broadly rounded and adorned marginally with numerous spinules; posterior subacuminate (or subcaudate) in both LV and RV, carrying about 5 large posteroventral spines; dorsal margin straight, sloping backwards slightly from front to rear; ventral margin mostly straight but weakly inflexed anteromedially in the mouth region; ornament of ridges and thorn-like spines. The dorsal ridge extends posteriorly from the eye tubercle, carries 2 thorn-like spines and terminates in a stout spine; behind and below this ridge there is another thorn-like spine at the posterodorsal corner of the valve; anteriorly, a marginal ridge commences in front of the eye tubercle and follows the margin until it meets the ventral ridge in the anteroventral region. The ventral ridge is strong and is more elevated in the rear than the dorsal ridge; it is strengthened along its length by buttresses and ends in a broad-based, powerful short spine. An arcuate subridge yokes the dorsal and ventral ridges in the posterior region of each valve. Greatest height is in the eye tubercle plane and equals about half the length. In dorsal view, the carapace is subhastate, with the greatest breadth posteromedial and about 37% of the length. *Internally*, the inner lamellae are moderately broad, with a regular line of conrescence and, possibly, a small posterior vestibule (Fig. 2 E); marginal pore canals are more numerous anteriorly than posteroventrally, flexuous and often branched; normal pore canals are sieve-type, celled and irregularly scattered; the central muscle scars comprise 4 adductors, a V-shaped frontal scar and a ventral mandibular scar; the hinge is amphidont-hemiamphidont with a weakly crenulate posterior tooth in the RV and a crenulate median element. Eye tubercle distinct. Sexual dimorphism, females shorter and higher than males.

DIMENSIONS (mm): Holotype, adult male, NMV Reg. No. P109896, L=0.96, H=0.44, B=0.36. Paratype, adult female, NMV Reg. No. P109897, L=0.92, H=0.44, B=0.34. Paratype, adult male, NMV Reg. No. P11792, L=0.95, H=0.44, B=0.35.

TYPE LOCALITY: Browns Creek Clays above the *Notostraea* Greensand horizon, at the Browns Creek coastal section near Johanna River, Victoria.

REMARKS: The type species differs from others in the genus in that the ventral ridge is only indistinctly perforated along its length.

GEOLOGICAL AGE: Aldingan-Janjukian, P 16-18 (Late Eocene-earliest Oligocene).

Alataleberis robusta sp. nov.

Figs 2A, B, C, 3D, E, F

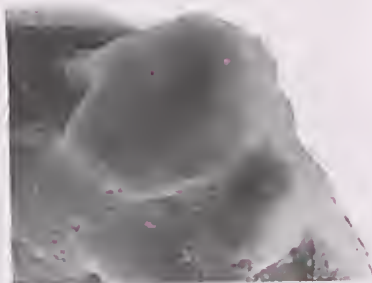
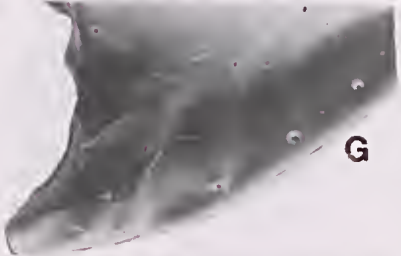
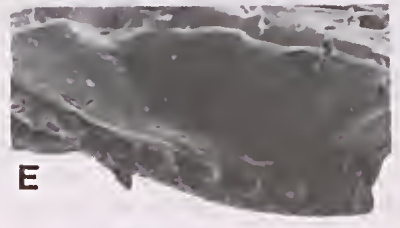
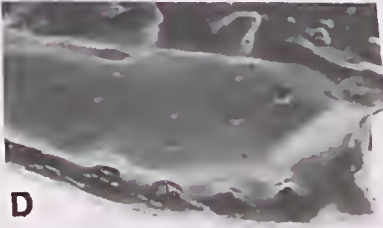
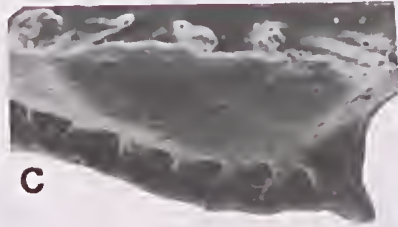
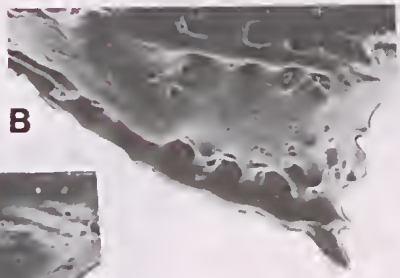
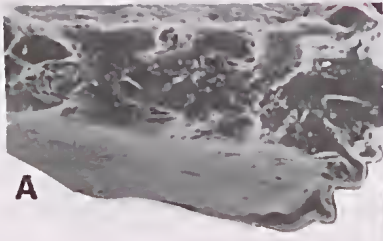
1974 *Alatacythere* sp. BCC 6 McKenzie, Plate 2, Fig. 6.

ETYMOLOGY: *robusta* (L)=robust.

MATERIAL AND DISTRIBUTION: Several carapaces and valves from the sections at Browns Creek and Castle Cove, Victoria.

DESCRIPTION: An *Alataleberis* of relatively large size (length 0.90-1.10 mm), subrectangular in lateral view with a smooth shell surface and distinct subcentral tubercle; anterior broadly rounded and adorned marginally with numerous spinules; posterior less broadly rounded in the LV and subcaudate in the RV, carrying several (5-8) strong marginal spines; dorsal margin straight, sloping backwards slightly; ventral margin mostly straight but inflexed anteromedially in the mouth region; ornament of ridges and spines. The dorsal ridge is more prominent than in other species and buttressed, ending in a stout spine; anteriorly a ridge follows the margin to the anteroventral corner where it meets the ventral ridge. The ventral ridge is very strong and inflated characteristically for the genus. The ridge increases markedly in height from front to rear, is strengthened by 6 buttressing struts, between which are perforations (about 6 overall) and ends in a powerful spine which carries 1-2 subsidiary spinules posteriorly. A yoking subridge is indistinctly defined on some specimens. Greatest height is in the eye tubercle plane and equals half the length. In dorsal view, the carapace is robustly subhastate, with the greatest breadth posteromedially and about two-thirds the length. *Internally*, the lamellae are moderately broad; line of conrescence regular; possibly a small posteroventral vestibule occurs; marginal pore canals are numerous, flexuous and usually branched; normal pore canals sieve-type and scattered; central muscle scars comprise 4 adductors, a V-shaped frontal scar and an anteroventral mandibular scar; dorsal muscle scars include at least 3 prominent scars above the central scar field of which 2 are mandibular muscle attachment scars; hinge amphidont-hemiamphidont, similar to *A. johannae*. Eye tubercle distinct. Sexual dimorphism, females shorter and higher than males.

Fig. 4—A, *Alataleberis johannae* sp. nov., paratype, dorsal, L.V., ala enlargement, $\times 90$. NMV Reg. No. P111792. B, *Alataleberis robusta* sp. nov., paratype, dorsal, L.V., ala enlargement, $\times 90$. NMV Reg. No. P111424. C, *Alataleberis ornithopetrae ornithopetrae* sp. nov., paratype, dorsal, L.V., ala enlargement, $\times 90$. NMV Reg. No. P111791. D, *Alataleberis ornithopetrae willungae* sp. nov., paratype, dorsal, L.V., ala enlargement, $\times 90$. NMV Reg. No. P111429. E, *Alataleberis miocenica* sp. nov., holotype, dorsal, L.V., ala enlargement, $\times 90$. NMV Reg. No. P111427. F, *Pterygocythereis jonesi* (Baird, 1850), dorsal, L.V., ala enlargement, $\times 85$. NMV Reg. No. P111796. G, *Alatalacythere* sp. 2 (specimen from the Mint Spring Oligocene, U.S.A.), dorsal, R.V., ala enlargement, $\times 95$. NMV Reg. No. P111800. H, *Alataleberis ornithopetrae ornithopetrae* subsp. nov., paratype, sieve-type normal pore, $\times 7,650$. NMV Reg. No. P111791. I, *Alataleberis miocenica* sp. nov., paratype, posterior, R.V. tooth of hingement, $\times 700$. NMV reg. No. P111423. J, *Pterygocythereis jonesi* (Baird, 1850), central muscle scar pattern, $\times 350$. NMV Reg. No. P111797.



DIMENSIONS (mm): Holotype, adult female, NMV Reg. No. P109900, L=0.90, H=0.46, B=0.56. Paratype, adult male RV, NMV Reg. No. P109901, L=0.96, H=0.48. Paratype, adult female, NMV Reg. No. P111424, L=0.90, H=0.45, B=0.56.

TYPE LOCALITY: Browns Creek Clays at the coastal section near Browns Creek, Johanna River district, Victoria. The species ranges from about 8 m below the *Notostraea* Greensand member of the Browns Creek Clays to the basal Castle Cove Limestone at Castle Cove, Victoria.

REMARKS: The species is differentiated from the other *Alataleberis* species by its more strongly alate appearance (especially in dorsal view), prominent and buttressed dorsal ridge and well-developed subcentral tubercle.

GEOLOGICAL AGE: Aldingan, P 16-17 (Late Eocene).

Alataleberis ornithopetrae sp. nov.

A. ornithopetrae ornithopetrae subsp. nov.

Figs 2F, G, 3G, H, I, J

1974 *Alatacythere* sp. McKenzie, Plate 2, Fig. 7.

ETYMOLOGY: *ornitho-* (Gk)=bird; and suffix *-petrae* (L)=rock; from Bird Rock, near Torquay, Victoria, and type locality.

MATERIAL AND DISTRIBUTION: A number of valves and carapaces from the Torquay district coastal section, Victoria, between Bells Headland and Bird Rock in the Jan Jue Formation and Point Addis Limestone of the Torquay Group.

DESCRIPTION: An *Alataleberis* with features intermediate between *A. johannae* and *A. robusta* in that it is almost as broad as the latter and has about 6 perforations in the expanded ventral ridge; but resembling the type species in having a weakly-developed subcentral tubercle and non-buttressed dorsal ridge. Further, the thorn-like dorsal ridge spines are more prominent than in other *Alataleberis* and there is also a strong posterodorsal spine beyond and below the end of the dorsal ridge. The eye tubercle is distinct. Sexual dimorphism present and similar to other species of the genus.

DIMENSIONS (mm): Holotype, adult male, NMV Reg. No. P109898, L=0.96, H=0.42, B=0.52. Paratype, adult female, NMV Reg. No. P109899, L=0.90, H=0.44, B=0.52. Paratype, adult male, NMV Reg. No. P111791, L=0.97, H=0.42, B=0.52. Paratype, adult female, NMV Reg. No. P111790, L=0.90, H=0.44, B=0.52.

TYPE LOCALITY: Jan Jue Formation at Bird Rock, near Torquay, Victoria, 1 m above the *Chione* bed.

GEOLOGICAL AGE: Janjukian, P 18-20? (Oligocene).

Alataleberis ornithopetrae willungae subsp. nov.

Figs 2H, 3K, L, M

ETYMOLOGY: *willungae*=locality name from the Willunga Embayment, South Australia where this subspecies typically occurs.

MATERIAL AND DISTRIBUTION: Numerous valves and carapaces from the Maslin Bay/Aldinga Bay coastal section, in the Tortachilla Limestone and in the Aldingan

Member and Ruwaring Member of the Port Willunga Formation.

DESCRIPTION: This subspecies is very like *A. o. ornithopetrae* except that all specimens are less broad in dorsal view. Further, the terminal spine of the dorsal ridge is strongly recurved, a feature which is lacking in *A. o. ornithopetrae*. Since the ranges of the two taxa are allopatric we feel justified in proposing a new subspecific name.

DIMENSIONS (mm): Holotype, adult female, NMV Reg. No. P111428, L=0.90, H=0.45. Paratype, adult male, NMV Reg. No. P111429, L=0.96, H=0.43, B=0.49. Paratype, adult male, NMV Reg. No. P111421, L=0.90, H=0.43, B=0.40.

TYPE LOCALITY: Ruwaring Member of the Port Willunga Formation, from the coastal section near the old jetty, Aldinga Bay, South Australia.

GEOLOGICAL AGE: Aldingan=Longfordian, P16-N6 (Late Eocene-Early Miocene).

Alataleberis miocenica sp. nov.

Figs 2D, 3N, O, P, Q, R

ETYMOLOGY: *miocenica* (L)=Miocene, for the geological age of this taxon.

MATERIAL AND DISTRIBUTION: A number of valves and carapaces from both limestone and marly facies in the Miocene formations of the Fyansford district, Victoria; the Fishing Point Marl of the Aire River district, Victoria; the Sherwood Marl of the Western Port Basin, Victoria; and at Clifton Bank near Hamilton, Victoria.

DESCRIPTION: An *Alataleberis* differentiated by its smaller size from all other species in the genus; from *A. robusta* and *A. ornithopetrae* by its more slender dorsal profile (similar to *A. johannae*); from *A. johannae* by a less strongly arcuate yoking subridge and by the occurrence (in *miocenica*) of 2 small perforations in the anterior part of the ventral ridge. The eye tubercle appears to be smaller than in other species of *Alataleberis* but is nonetheless distinct. Sexual dimorphism present, following the established pattern for this genus.

DIMENSIONS (mm): Holotype, adult male, NMV Reg. No. P111427, L=0.80, H=0.36, B=0.32. Paratype, adult female, NMV Reg. No. P111426, L=0.76, H=0.38, B=0.32. Paratype, adult male LV, NMV Reg. No. P111425, L=0.80, H=0.36. Paratype, adult male, NMV Reg. No. P111422, L=0.79, H=0.35. Paratype, adult female, NMV Reg. No. P111423, L=0.79, H=0.40.

TYPE LOCALITY: Fyansford Clay in the Batesford Limestone quarry, near the base of the upper bench, Fyansford, Victoria.

GEOLOGICAL AGE: Longfordian-Balcombian, N 6-9, (Early-early Middle Miocene).

DISCUSSION ON STRATIGRAPHIC UTILITY

Our investigation of the diversity in *Alataleberis* has covered a wide range of Tertiary formations and facies, notably the classic Maslin Bay/Aldinga Bay section, near Port Willunga and some Willunga Embayment boreholes, South Australia; plus the full extent of Tertiary outcrops in Victoria, from the Port Campbell and

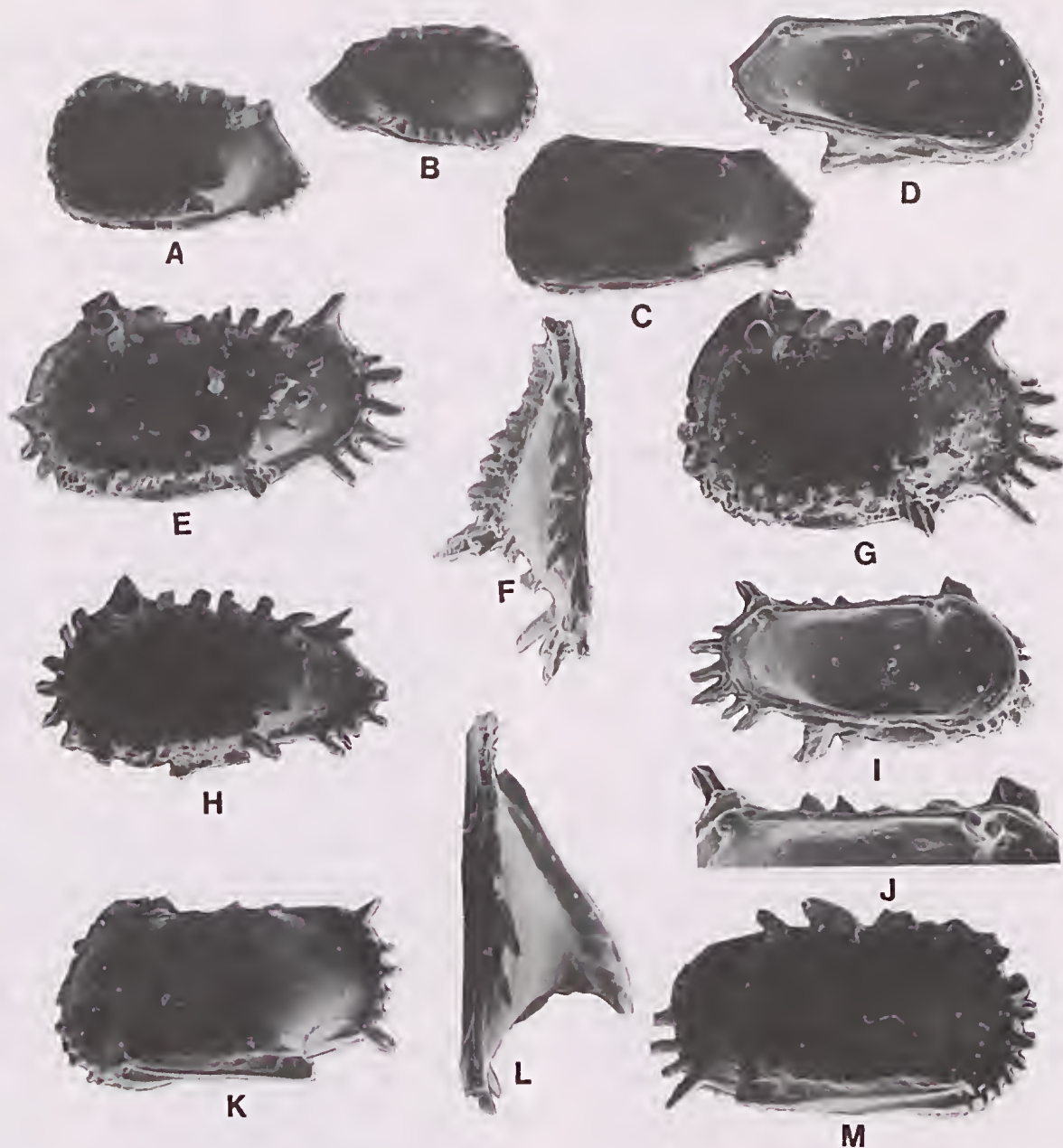


Fig. 5—A, *Pterygocythereis* sp. (from Alum Bluff Chipola Miocene, U.S.A.) lateral L.V., $\times 45$. NMV Reg. No. P111794. B, *Pterygocythereis* sp. (same as above), lateral, R.V., $\times 45$. NMV Reg. No. P111793. C, *Alatacythere* sp. 1 (from Chickasawhay Lst, U.S.A.), lateral, L.V., $\times 45$. NMV Reg. No. P111795. D, *Alatacythere* sp. 1, L.V., $\times 45$. NMV Reg. No. P111795. E, *Pterygocythereis jonesi* (Baird, 1850), lateral, L.V., $\times 50$. NMV Reg. No. P111797. F, *Pterygocythereis jonesi* (Baird, 1850), dorsal, L.V., $\times 50$. NMV Reg. No. P111796. G, *Pterygocythereis jonesi* (Baird, 1850), lateral, L.V., $\times 50$. NMV Reg. No. P111796. H, *Pterygocythereis ceratoptera* (Bosquet, 1852), lateral, L.V., $\times 50$. NMV Reg. No. P111798. I, *Pterygocythereis jonesi* (Baird, 1850), lateral, L.V., $\times 45$. NMV Reg. No. P111797. J, *Pterygocythereis jonesi* (Baird, 1850), hinge enlargement, $\times 60$. NMV Reg. No. P111797. K, *Alatacythere* sp. 2 (specimen from Mine Spring Oligocene, U.S.A.) male, lateral, L.V., $\times 45$. NMV Reg. No. P111799. L, *Alatacythere* sp. 2, female, dorsal, R.V., $\times 50$. NMV Reg. No. P111800. M, *Alatacythere* sp. 2, female, lateral, R.V., $\times 50$. NMV Reg. No. P111800.

Hamilton districts eastwards to Lakes Entrance and Orbost in Gippsland, including the classic Bells Headland to Bird Rock coastal section, near Torquay and the Tertiary in the Geelong area. We believe that our records of occurrence for *Alataleberis* are as accurate as we can make them, a corollary of this being that the genus does not occur east of the Western Port Basin—at least in outcrop, since we have not viewed Gippsland Basin borehole material.

In assessing the stratigraphic usefulness of *Alataleberis* it is first necessary to determine the evolutionary sequence. In our opinion, the most plausible ancestor for the group is *A. robusta*. This taxon is facies transgressive and the earliest to appear since we have it from about 8 m below the *Notostraea* Greensand member at Browns Creek. This member is the equivalent of the Tortachilla Limestone at Maslin Bay and both units have been dated recently as P16 (Late Eocene) based on calcareous nannofossils and the common occurrence of *Hantkenina* (H.) *alabamensis primitiva* Cushman & Jarvis (Shafik 1981). With *A. robusta* as ancestor, several evolutionary trends are evident.

1. Only *A. robusta* has a well-defined subcentral tubercle, the trend is to a poorly-defined subcentral tubercle in the other species
2. There is a decrease in size from Eocene to Miocene, *A. robusta* being the largest and *A. miocenica* the smallest species.
3. Carapace breadth also decreases with time. Thus *A. robusta* is broader than *A. ornithopetrae*; and *A. johannae* is broader than *A. miocenica*.
4. The buttressed dorsal ridge of *A. robusta* gives way to the strongly spinose dorsal ridge of *A. ornithopetrae* and this in turn to the less-strongly spinose ridges of *A. johannae* and *A. miocenica*.
5. The buttressed ventral ridge is distinctly perforated in the more alate and older taxa (*A. robusta*, *A. ornithopetrae*) but either imperforate or nearly so in *A. johannae* and *A. miocenica*.

The complex of characters defined in the set of trends listed above makes species of *Alataleberis* easy to identify. Since each species has a relatively limited time range, at least in Victoria, this makes them all stratigraphically useful, although (as might be expected) the control is not as precise as it would be if based on planktonic foraminiferans or nannofossils. An advantage of the ostracode *Alataleberis* is that the species are relatively large (0.75-1.10 mm) and easily recognisable in washings or "floats". Further, none of the species are facies restricted since all have been recorded from a variety of nearshore marl and limestone facies. These range from grits to clays and well-oxygenated to poorly-oxygenated sediments. The relevant palaeotemperatures likewise are variable, from about 14-23°C (Gill 1968).

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